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## MONTAIGNE AND THE 'PHYSITIONS'

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Few pictures in literature are more pleasing than that of Montaigne in his library, engaged in the self-appointed task of penning the essays on which rest his fame. He himself has sketched for us the detail. The room, almost circular in shape, occupied the third floor of the tower which guarded the entrance to his chateau. From the bay-windows of the library itself and from the "pleasantly windowen" cabinet next adjoining, the prospect, when the writer paused to observe it, was one of more than ordinary beauty. Immediately below and in the foreground of the picture was the garden, court, and yard of the chateau. Beyond stretched a "farre extending rich and unresisting prospect" of fertile valley, teeming vineyard and wooded hillcrest, which the chateau itself, "pearched upon an overpearing hillocke," dominated.

Within, in the almost circular enclosure, the only straight wall of which served to afford a place for the author's table and chair, his books were placed, so that "at one look it offreth me the full sight of all, set around about upon shelves or desks, five rancks one upon another." How he loved them, pored over them when the occasion suited, to what profit has he delved into their mysteries, and how searching and succinct are his comments. Where in all literature is there such a confession, such an appreciation of what books are to a booklover? "I enjoy them as a miser does his gold, to know that I may enjoy them when I list; my minde is settled and satisfied with the right of possession. I never travel without them, nor in peace nor in warre, yet do I passe many dayes and moneths without using them. It shall be anon, I say, or tomorrow or when I please. For it is wonderful what repose I take and how I continue in this consideration that they are at my elbow to delight me when time shall serve, and in acknowledging what assistance they give unto my life. This

is the best munition I have found in the humane peregrination, and I extremely bewaile those men of understanding that want the same."

From the essays themselves we have learned practically all we know of him, his student days, his experiences in the hunting field, in court, and in camp and in travel. It was a time when indeed the hand must be taught to guard the head, when it was often extremely difficult to draw the line between what was frankly brigandage and outlawry on the one hand, and, on the other, the sudden flarings up of internecine strife of rival claimants for the reigning power. The honors which came to him unsought were well deserved ones, fitting to be bestowed on one schooled in the learning of his time, experienced in camp and court and field. The early decision to exchange a hitherto active life for one of retirement, contemplation and study was but the expression of a philosophical temperament little heedful and probably distrustful of the call of ambition or the lure of acquisition. Thankful, indeed, we should be for the decision, since to it we are indebted for the mixture of apt illustration, wise comment and shrewd observation which go to make up the Essays, the whole flavored with the tang of a translation, which has added to rather than detracted from the original. So much is this the case that at times we wonder which was Florio and which was Montaigne, just as we are apt to wonder where Fitzgerald commences and his author of the Persian quatrains left off.

There can be little doubt of the competence of his qualifications, qualifications based on the varied experiences of one by nature little prone to accept things or individuals at their face values. He was sufficiently a philosophic doubter or sceptic to hesitate at accepting definitions or tales or explanations which were based on the occult or the miraculous. As much as was the case with Renan, it was impossible for him to accept explanations which did not conform to his knowledge or experience and which presupposed intervention by miracle working. He was inclined to believe that there were few phenomena in nature which could not be explained in the

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light of knowledge or reason or experience. Possibly he relied too much on experience in many of his comments on medical practice, a failing however more excusable since scientific knowledge in many medical fields was then sadly wanting, when compared with what we now have. Failing this knowledge, and the surety resulting therefrom, there was little more than the light of experience to guide, and the light might appear to us now as little more than a will o' the wisp. His own comment in this connection is impressive. "There is no desire more natural than that of knowledge. We attempt all things that may bring it unto us. When reason fails us, we employ experience." Limited as he was to an extent which we can hardly appreciate, it is all the more creditable that he stands for us as the sixteenth century prototype of "the man from Missouri," the man who must be shown.

Apart wholly from the qualifications of temperament and ability, his acquaintance with the medical practice of his day was not one based wholly on theory or hearsay. Like the woman in Holy Writ, he may have felt that he had suffered many things of many physicians, and was therefore well qualified to discuss their merits and shortcomings. It had been in his crowded life his ill fortune to have had rather more than the usual number of experiences when medical aid had perforce to be sought. He had suffered accidents and injuries of so great severity that his life had several times been despaired of. For years a sufferer from a stone in the bladder, some of his travels had been for the purpose of taking treatment at baths and springs which promised to secure for him some measure of relief from the tortures of which he writes so expressively. Though he little knew what the future had in store for him at the time when his essays were being penned, it is quite likely that he foresaw that which was to be the outcome, and that he was not to be gifted with the length of years of his father, grandfather, or great grandfather, all of whom had lived more than the ordinarily allotted span. His physical condition may have been one of the reasons for his early retirement from an active life. His habits of reading and study had made him acquainted with all the literature of his day. Few, therefore, more than he were competent to discuss medical matters from the angle of their appeal to the laity, and his criticisms and comments, made though they were nearly three hundred and fifty years ago,

may have in them that which will not only elicit our interest, but which may result in profit.

It seems not to be entirely without significance that it is in one of his last and longest essays, that one on "Experience," there are to be found most of his views on matters relating to health. In few of them, however, are there not to be found some comments which have a medical bearing. His essay "Upon some verses of Virgil," also in the third and last of the volumes, and one often referred to and possibly read for purposes other than moral instruction, has, for example, some observations with which the social hygienist of most modern times would take pleasure in agreeing. It is that portion which deals with the difficulty of teaching the young in a rational way the essential facts relating to sex, and the inadvisability of their being left in utter ignorance concerning a matter on which their entire future might to a great extent depend. Similarly, in very few of the essays are there not to be found some medical allusions, based on personal experience or the result of his garners from the literature available to him, often introduced in some discursive way and little in keeping either with caption or text. The final essay, "Of experience," is possibly one of the least rambling of any of his works, and personal hygiene, or at least his own personal hygiene, bulks very largely in the subject matter.

Everyone probably has heard the old saying that "a man at forty is either a fool or a physician," and everyone understands the significance of it. Montaigne, quoting Tiberius and Socrates, is of the opinion that the individual should have learned the lesson long before forty years of experience had served to impress on him the teaching. "Whosoever had lived twenty years, should be able to answer himself of all such things as were either wholesome or hurtfull for him, and know how to live and order his body without Phisicke." The transition from this thought to the one that "themselves should first have the pox, if they will know how to cure them in others" is not long or difficult, and though we here might have some repugnance in following him, we cannot but admit the aptness of his illustration. "Others but guide us, as one who sitting in his chair paints seas, rockes, shelves and havens upon a board, and maketh the modell of a tall ship, to saile in all safety; but put him to it in earnest, he knowes not what to doe nor where to begin. They make even such a description of our infirmities as doth a town-crier,

who crieth a lost horse or dog, and describeth his haire, his stature, his eares, with other markes and tokens, but bring either unto him, he knowes him not." Thence the essay proceeds. "I have lived long enough to yeeld an account of the usage that hath brought mee to this day." There follows quite a complete outline of personal hygiene, in so far at least as he himself is concerned, which omits few of the items which would be considered by a present-day lecturer. There are referred to the matters of heating and ventilation, habits of eating, drinking, and sleeping, table usages and manners, sexual and dental hygiene, the necessity for regularity of the bowels, the importance of exercise and correct clothing, all given in such a way as quite to convince us that in his own case at least the lessons of experience had been thoroughly absorbed, and that he yielded to no man in placing a high value on what is often a very fleeting possession, health. He "thought health worthy to be purchased with the price of all cauteries and incisions, how painefull seever." "Health," he says, "is a very precious jewell, and the onely thing that in pursuit of it deserveth a man should not onely employ time labor sweate and goods but also life to get it, forasmuch as without it, life becommeth injurious unto us." Nothing should be permitted to stand in the way of its possession and retention. He would go to the uttermost limits in this respect, for imagine this concession won from him, the booklover: "Books are pleasant, but if by frequenting them, we loose at length gaiety and health, our best possessions, let us leave them. I am one of those who think their fruit cannot countervail this loss."

The essay in which there most appears his criticisms and comments on the physicians is that "Of the resemblance between children and fathers." It is a very good example indeed of the feature which is so great a characteristic of his writings, a feature which adds to the charm of the work, in that, from the caption of an essay one can tell extremely little the path along which the author's fancy will lead him. There are in this one, however, some comments along lines quite in keeping with the title, in that he has speculated respecting the hereditary character of the disease from which both he and his father were sufferers. "I was borne five and twenty yeares before his sickness, and during the course of his healthy state his third child. Where was all this while the propension or inclination to this defect hatched? And when he

was so farre from such a disease, that light part of his substance wherewith he composed me, how could it for her part beare so great an impression of it? And how so closely covered, that fortie five yeares after, I have begunne to have a feeling of it? And hitherto alone, among so many brethern and sisters, and all of one mother. He that shall resolve me of this progresse, I shall believe him as many other miracles as he shall please to tell mee, always provided hee goe not about to pay me, with a doctrine much more difficult and fantastical, then is the thing itself."

From this speculation he proceeds to comment, at times with a degree of sharpness or causticity somewhat unusual in his writings, on a number of characteristics which he believed to be discernible among the physicians of his day. He was not, however, a hostile or carping critic. Few individuals have expressed more high appreciation of the places which medical practitioners had in the social structure. "So likewise in Physicke, I know her glorious name, her proposition and her promise, so profitable to mankind. As for me I honour Physitons, not according to the commonly-receiv'd rule, for necessitie sake, but rather for the love I beare unto themselves." Though such encomiums were, he thought, merited, there were those among them who were not disposed to strive for the high ideals which should be their aim. One specific criticism the profession has undoubtedly outgrown. "The very choyce of most of their drugges is somewhat mysterious and divine. The left foote of a tortoise; the liver of a mole, blood drawne from under the right wing of a white pigeon, Rattes pounded to small powder, and such other foolish trash, which rather seeme to be magike-spells or charmes than effects of any solid science." These are not now to be found in any reputable pharmacopeia, and from their use we have been freed, but he is an optimist indeed who would attempt to claim that the profession even of today has wholly sloughed off all the features to which he takes objection.

For example, he deplores the sudden and startling reversals of judgment respecting the origins and cause and treatment of disease which have been a feature of medical history. On quite insufficient grounds, the observations of years have been disregarded many times, and conclusions arrived at by the way of premises assumed rather than assured. At very considerable length he details the alterations of opinion respecting

disease causation, as one medical worthy after another developed a theory or expressed a belief, and few of these were so bizarre that they were not in some quarters or at some time given some credence or obtained some following. Five such are named before the name of Hippocrates appears on the list, and it is of interest to note that it appears only to be followed by the comment that "whatever he established Chrysippus overthrew." So the catalogue continues, even down to the time of Paracelsus. These, he charges, "do not only change a receipt, but also the whole conjecture and policie of physickes whole body, accusing such as hitherto have made profession thereof, of ignorance and cousinage. Now I leave to your imagination, in what plight the poore patient findeth himselfe." In the development of this criticism, we observe with much interest that he adduces as proof the fact that even concerning the practice of blood-letting so commonly practiced in his day there was a difference of opinion, and that one physician, "one of the most famous in all our country," had published a book decrying it as a universal panacea. Who that forward-thinking individual was whose opinion availed so little towards halting a custom which proceeded unabated for several hundred years, he does not inform us, being contented with citing the example in support of the contention that among medical men there were almost as many opinions as there were individuals.

Another criticism is one which appears to us to be a most natural one, knowing as we do the man by whom it was made. He whose delight it was in his leisure moments to mark or write on the walls, ceilings and beams of his study (where they still are to be seen) such mottoes as the following: "Men are tormented by the opinion they have of things, not by the things themselves" or "No man has ever known or ever can know anything certain" or "It may be, it may not be," would have, we surmise, little patience with dogmatic assertions based on insufficient premises. For such the caustic comment was reserved: "Cause a purgation to be prepared for your braine: it will be better emploied unto it, then to your stomache."

The cultivation of a high idealism, the development of a critical faculty, and the correct application of science and reason are, then, essentials for those who follow the straitened paths leading to success. Essential also are training

and study if progress is to be made in the healing art. "He (the physician) hath neede of many parts, divers considerations and severall circumstances to proportion his desseigne justly. He ought to know the sick man's complexion, his temper, his humours, his inclinations, his actions, his thought and his imaginations. He must be assured of externall circumstances; of the nature of the place; the condition of the aire; the quality of the weather; the situation of the planets; and their influences. In sickness, he ought to be acquainted with the causes, with the signes, with the affections and criticaH daies; in drugges, he should understand their weight, their virtue and their operation, the country, the figure, the age, the dispensation. In these parts, he must know how to proportion and referre them one unto another; thereby to beget a perfect symmetrie or due proportion of each part; wherein if he misses never so little, or if amongst so many wheels and several motions, the least be out of tune or temper; it is enough to marre all."

But any or all of the comments made up to the present fail to present him in the light of the philosopher he undoubtedly was, though his acute observation, his facility of apt illustration and wide reading may have been noted. If these latter are evident, the former is at least as pronounced a feature observable throughout his volumes. Death, the inevitable, had therefore a prominent place in his thought, as it bulked largely in his writings. "Thou diest," he reminds us, "not because thou are sicke; thou diest because thou are living. Death is able to kill thee without the helpe of any sicknesses." Inescapable and inevitable, the preparation for it should be constant and adequate. "A man should ever, as much as in him lieth, be ready booted to take his journey, and above all things, looke he have then nothing to doe but with himselfe." "I would have a man to be doing, and to prolong his lives offices, and let death seize upon me, whilst I am setting my cabiges, carelesse of her dart, but more of my imperfect garden." "No man did ever prepare himselfe to quit the world more simply and fully, or more generally shake of all thought of it, than I am fully assured I shall doe." "Now hath old age need to be handled more tenderly. Let us recommend it unto that God, who is the protector of health, and fountaine of all wisedome; but blithe and sociall."

## DIPHTHERIA IN DELAWARE

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There were more diphtheria deaths in Delaware in 1930 than in any year since 1925, despite the fact that diphtheria is preventable and that the State Board of Health has immunized more than fourteen per cent of the entire population of the state. There may be several reasons for the increase. A study of the statistics over a period of years discloses the fact that approximately seventy per cent of all diphtheria deaths have been among children of preschool age, yet this group constitutes only ten per cent of those immunized by the state. Another interesting fact is that there has been an increase in the number of diphtheria deaths about every six years. This six-year cycle is very evident in this state, but the explanation is difficult.

The work of immunization was started in the schools, regardless of the fact that it was known that more deaths occurred among the group under six years of age, because the schools furnished the most practical place from which to reach the homes, and because those of school age were not protected to a satisfactory degree. It was expected that through the children and the Parent-Teacher Association, parents could be induced to have the preschool children brought to the schools for immunization with the school children. In some schools, when the teacher took a keen interest in the work, a large percentage of preschool children in the district was reached, yet for the most part, comparatively few preschool children have been immunized. This is especially true in Wilmington, where only five per cent of the immunizations have been among preschool children. During the last year, no deaths from diphtheria occurred in that city among school children, yet the preschool rate increased slightly. Another reason for the high diphtheria increase among preschool children is that the older brother or sister who has received the immunization at school may become a virulent carrier and bring the infection home to the susceptible child. This in itself is reason enough why the preschool child should receive the protective immunization.

A record of every child immunized by the State Board of Health is kept in the office files, and every case, death, and positive throat culture is checked with the names in the files. Only

seven children who have completed the three treatments have later had diphtheria, and none has died.

The question of what preparation to use is often asked. The State Board of Health has used four different preparations at various times since 1926.

At first, toxin-antitoxin (horse serum) was used. The results seemed to be very good and the reactions were not severe. Instructions regarding the method of the administration of antitoxin to prevent anaphylaxis among those previously immunized were sent to all physicians. During the following summer, complaints were made to the State Board of Health regarding the anaphylaxis following administration of tetanus antitoxin. An attempt was made to remedy this condition, but it was not until two years later that toxin-antitoxin with goat or sheep serum became available. Sheep serum toxin-antitoxin was used first. This was administered the same as toxin-antitoxin horse serum, three doses at seven-day intervals. The next year, the toxin-antitoxin with goat serum was used in the same manner. The results were not as good as with the horse or sheep serum. The following year, toxoid was used because it contained no serum and it was claimed that immunity was established at a shorter interval of time and because there were only two doses necessary.

To determine the percentage immunized after having received the treatments, and to obtain data regarding the effectiveness of the various preparations used, Schick tests were administered to approximately fourteen hundred children previously immunized, located in various parts of the state outside of Wilmington. In the tabulation of the results, only those whose records of immunizations were in the office of the State Board of Health were considered. All Schick tests were administered and read by the same physician, using the same technique, and the material from the same source. No so-called modified Schick tests were used.

It has been our experience that it is more difficult to immunize the older school children and adults than the preschool and young school children. Because of this, it seemed advisable to determine the percentage of immune individuals in the various age groups. A more careful study of the results of the Schick tests brings out some interesting facts regarding the various preparations which are worth considering. In this series of cases, it was learned that the goat serum did

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not produce immunity among as large percentage of cases for any of the age groups as the other preparations. The toxoid apparently produced results just the reverse from all other preparations. The younger the group, the fewer immunized. If this represents the true value of the preparation, some change must be made to accomplish a reduction in the number of diphtheria cases and deaths among young children. At the present time, we are using two doses of toxoid at three-week intervals. Should three doses of toxoid be used among infants and children under ten years of age, or should toxin-antitoxin sheep serum be given? The toxoid would produce immunity at an earlier date but would have no other particular advantage. In our clinics, it has been our experience that toxoid generally produces more severe reactions, both local and constitutional, among all groups over ten years of age than any preparation of toxin-antitoxin. The percentage of positive reactions for various age groups and various preparations is tabulated below:

TOTAL POSITIVE REACTIONS BY AGE GROUP AND YEARS						
Year	1926	1927	1928	1929	1930	
Immunizing Agency	T. A. T.	Toxoid (Horse) (Horse) (Sheep) (Goat)				
1-6 yrs.	18%	15%	6%	31%	30%	
6-9 yrs.	15%	21%	23%	30%	16%	
10-15 yrs.	18%	24%	18%	33%	9%	
Over 15 yrs.	100%	83%	16%	50%	0%	
	Only 1 case					

The total positive Schick reactions or the number not immune for all ages, sex, and color, varied somewhat with the preparation used to produce immunity. The horse serum used in 1926 caused immunity in eighty-two per cent of the cases. These immunizations were mostly in the larger towns of the state. In 1927, the same preparation produced immunity in seventy-nine per cent of cases. These were for the most part in the small school districts in the rural areas. In 1928, sheep serum was used. Of those tested from this group, eighty-two per cent were found to be immune. These immunizations were about evenly distributed over the state outside of Wilmington. Goat serum toxin-antitoxin was used in 1929 over much the same area as in the previous year. As determined by the Schick test, only sixty-eight per cent so immunized were found to be immune. The toxoid used in 1930 produced immunity in eighty-five per cent of cases tested.

To determine whether the above figures are correct for a larger series of cases, more than forty-two hundred Schick tests administered in

the city of Wilmington under the same conditions by the same physician are being carefully tabulated.

When the diphtheria immunization work was first started, Schick tests were administered first and only those giving positive reactions were given the inoculations. In this series, slightly more than forty-one per cent reacted. In a small series of cases having previously received only one treatment of toxin-antitoxin, forty per cent were positive; another series having received two treatments, thirty per cent reacted, whereas the series having received the complete immunization, twenty-six per cent were positive.

The Schick test is not being given before immunization at the present time. The so-called modified Schick test is used whereby the first dose of the immunizing agent is injected hypodermically and the degree of local reaction is noted at the time of the next inoculation. If practically no reaction has taken place, the parents are advised that the child has a degree of protection against the disease; however, the children are permitted to complete the series of inoculations if they so desire. This method is not practical with toxoid because the longer interval between inoculations makes the interpretation of the reactions much more difficult.

During the five years that immunization against diphtheria has been done by the Board of Health, one interesting condition has occurred several times. Several teachers and parents have been immunized at their request, at first, because of their fear of contracting diphtheria. Later, others came for the immunization because of benefits derived from the inoculations of which we had no knowledge or satisfactory explanation. There have been reported to the Board of Health several cases in which the immunizing dose of toxin-antitoxin has been responsible for protection against frequent attacks of tonsilitis or "sore throat." At first, little attention was given to these reports, but for the past two years, they have been noted with interest yet in no case has any suggestion been made that might cause the individual to make such claims. No investigation has been made, no scientific explanation has been attempted, no beneficial effects of toxin-antitoxin or toxoid against tonsilitis are claimed by the Board of Health. Neither is it recommended particularly for that purpose, yet the fact remains that during each campaign, adults ask for the inoculations as a tonsilitis preventive. It is only mentioned here

because it is an interesting condition to those who are administering the diphtheria immunizations, and because of its rather frequent occurrence it is deserving of some consideration and thought.

#### SUMMARY:

1. The diphtheria death rate remains comparatively high because of the unprotected preschool children who may be subject to exposure to the disease, possibly because of an immunized school child in the family who may be a virulent diphtheria carrier. All children should be immunized at the age of six months.

2. A six-year cycle of high diphtheria death rate occurs in the state.

3. A satisfactory decline in diphtheria has occurred among those immunized.

4. The choice of immunizing agency should be made only after considering several factors.

Toxin-antitoxin horse serum is effective but predisposes the individual to the possibility of anaphylaxis should it be necessary to administer antitoxin at a later date. There are three inoculations. Immunity is produced in about six months. The reactions are not severe.

Toxin-antitoxin sheep serum does not predispose to anaphylaxis as does horse serum. It is effective for all age groups. The reactions are not severe. Immunity is produced in about six months.

Toxin-antitoxin goat serum, in our experience, has not been as effective as other preparations.

Toxoid, as determined by Schick tests, in this state, is very effective in the older age groups. It is not effective in two doses among infants and young children. If it is to be used in this group, it is suggested that three doses be given. It does not predispose to anaphylaxis. The local and constitutional reactions may be rather severe among those over ten years of age. Immunity is established in about eight or ten weeks.

5. Does toxin-antitoxin prevent certain types of tonsilitis? If so, why?

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## THE TREATMENT OF DIPHTHERIA\*

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In a case of diphtheria we know that the toxin is situated in the region of the upper respiratory tract which is attacked, and that the toxin units first with the adjacent tissue and then the excess passes by the lymphatic channels to the blood and so is distributed throughout the body. We know, from experimental investigation, that there is a period of a few hours after

the toxin has come in contact with the cells that the union is incomplete and that the toxin can still be neutralized by the antitoxin. When, however, union has taken place, little or no good results from the use of antitoxin. If for instance, we give a rabbit an intravenous injection of ten fatal doses of diphtheria toxin, we cannot neutralize that toxin if we delay the giving of antitoxin for more than one-half hour. Fortunately, in an ordinary case of diphtheria a very moderate amount of toxin escapes being fixed by the local tissues and passes to the blood within the first 24 hours.

In considering the dosage of antitoxin we must keep in mind that it is not the amount of toxin in the body which determines the amount of antitoxin to be given. If all the toxin in the most malignant case could be extracted and placed in contact with antitoxin, less than 100 units of antitoxin would neutralize it. We give much larger doses than this because the antitoxin after entering the blood gradually passes through the walls of the capillaries to be dispersed to all regions of the body. As only a slight percentage of the antitoxin in the blood passes out through the capillaries within a limited period of time, we realize the wisdom of giving a great excess, so that in a short time the amount which passes to the tissues will be sufficient to neutralize any unattached toxin. The need of speed in severe cases makes us choose different methods for administering antitoxin in mild, moderate, and severe cases. In mild cases an intramuscular or even a subcutaneous injection of a moderate amount is good treatment; in severe cases an intravenous combined with intramuscular injection is much more effective. In very severe and toxic cases an intravenous injection is absolutely indicated. The serum when given should be fairly warm.

The objection to the intravenous injection is that there is a slightly greater danger of severe shock, perhaps even fatal anaphylactic shock. This occurs possibly once in 20,000 cases, while in intramuscular injections, probably only once in 60,000. If, however, we inquire as to the history of asthma and as to whether previous injections of horse serum have been given, and neither of them is true, and if we also give the serum very slowly, there is almost no chance of serious consequences. Even if a history of asthma or previous serum injections is obtained, it is probably wise, in a severe case, to give an intravenous injection, but it should be done very

\*Abstracted from the Bulletin of the New York Academy of Medicine, by permission of the author.

slowly. We may possibly at some time cause a death by giving it intravenously in these cases, but meanwhile we will have saved many who would otherwise die. In the following table is given our present practice:

acts to serum. We place a drop of the serum on the eyelid and wait for 15 minutes. If no reaction develops, there is little probability of its following a dose of serum. If a reaction does develop, we use great caution in giving a thera-

#### AMOUNT OF ANTITOXIN REQUIRED IN THE TREATMENT OF A CASE

	Mild Cases	Moderate	*Severe	*Malignant
Children up to 60 lbs. in weight (under 15 years of age) -----	3,000 units to 5,000 units	5,000 units to 10,000 units	10,000 units to 20,000 units	15,000 units to 30,000 units
Older children and adults 60 lbs. and over in weight -----	3,000 units to 5,000 units	10,000 units to 15,000 units	20,000 units to 40,000 units	30,000 units to 60,000 units

\*When given intravenously the smaller amounts stated.

Cases of laryngeal diphtheria, moderate cases seen late at the time of the first injection, and cases of diphtheria occurring as a complication of the exanthemata should be classified and treated as "severe" cases.

In all cases a single dose of the proper amount, as indicated in the schedule, is recommended. No further injections of antitoxin are necessary.

It is recommended that the methods of administration be as follows:

Mild Cases—Intramuscular.

Moderate Cases—Intramuscular.

Severe Cases—Intravenous or partially intramuscular.

Malignant Cases—Intravenous.

There is still doubt in the minds of many physicians whether a single dose of antitoxin is sufficient. There is no question that usually twelve hours after the first injection of antitoxin, many cases still remain very sick and that if a second dose is given, they may in the next 12 hours become much better. If, however, one does not give the second injection, one will just as often find them improved. It takes a certain length of time for the antitoxin to neutralize the toxin in the tissues, and for the inflammatory reaction to begin to subside. Some probably do not fully appreciate the fact that the antitoxin in an intramuscular injection is only gradually passed out to the blood. At the end of 24 hours only about sixty per cent has been absorbed, and it is two days before it is almost entirely absorbed. It is as if repeated tiny injections were being given intravenously every half hour for two days. There is no harm in repeating the injections, but if a sufficient dose has been given at the first injection, there is no advantage, while there is distinct harm in giving half the amount needed at the first injection and supplementing this with a second dose twelve hours later.

One can usually detect those in whom injection of serum will be followed by the development of untoward symptoms by finding out whether the mucous membrane of the eyelid re-

peutic dose. The question as to how much we can desensitize a patient is still debatable. If 5 c. c. of serum are given subcutaneously or intramuscularly and no reaction results, we are almost certain that no reaction will develop if we repeat the dose. If we double it, however, we may get a reaction. There is some degree of desensitization, but it is not at all something which can be relied upon. The dosage of antitoxin varies.

The use of antitoxin to produce passive immunization against diphtheria is exceedingly successful. I doubt whether any case of diphtheria has ever developed within a week after a person had received a thousand units of antitoxin. We must remember that this passive immunity is not lasting. It is quite different from that which develops after toxin-antitoxin or toxoid. It is interesting to note that in the 35 years which have elapsed since the discovery of antitoxin and the twelve years since the general use of toxin-antitoxin or toxoid, that the death rate has been reduced from 150 to about 3.

Undoubtedly, the severity and mortality of diphtheria have lessened considerably during these 35 years owing to general health measures, but the most careful scrutiny of the facts makes us confident that much of it is due to diphtheria antitoxin and to toxin-antitoxin.

## TULAREMIA

E. F. SMITH, M. D.\*  
Georgetown, Del.

Tularemia gets its name from the county in which it was discovered, by McCoy, in 1911; *viz* Tulare County, California. Though this dates back only twenty years, the disease undoubtedly existed and was described under other names long before its "official" discovery.

The organism causing the disease, bacterium tularensis, was discovered by McCoy and Chapin in 1912. It was at first recognized as a disease affecting principally wild rabbits, but in 1911, Pearse, of Utah, described six human cases under the heading of "insect bites." Vail, Wherry, and Lamb, of Cincinnati, in 1914, described a human case as "Bacillus tularensis infection of the eye." Francis, in 1919 and 1920, described "deer-fly fever" and named it "tularemia."

The infection is insect borne, but man also contracts the disease from handling carcasses or animals which are infected. This accounts for its incidence among hunters, cooks, market men, and laboratory workers.

The incubation period is from twenty-four hours to ten days; the onset is sudden, with headache, chills, body pains, vomiting, and fever. An inflamed painful papule usually develops at the site of infection, but this may be absent. This has been noted particularly in laboratory workers. This papule soon breaks down and sloughs, leaving a small punched-out ulcer with raised edges. The regional lymph glands become painful and swollen, and often suppurate. The fever usually lasts two or three weeks, with a transient remission on the third or fourth day, or daily remissions suggesting a septic type of fever. Convalescence is slow and long drawn out, and weakness lasts for several months, maybe a year. Fatal cases in man are rare, although a few deaths have been recorded.

Bacterium tularensis is a small organism occurring in coccoidal, bacillary, and bipolar forms; it is Gram-negative, aerobic, without spores, and non-motile; it grows only on coagulated egg-yolk or glucose cystine sugar. In smears, it stains well with aniline gentian violet and, in sections, it stains best with Giesma solution. It is killed at 56° to 58° C. in ten minutes. The usual germicides are effective. The virus resisted drying in bed-bug feces for twenty-five days. Re-

frigerated rabbits are infective after three but not after four weeks.

### CLINICAL FORMS

Dr. Francis described four clinical types of tularemia.

I. Ulcero-glandular, in which the primary lesion is a papule of the skin, which later becomes an ulcer with raised edges; accompanied by enlargement of the regional lymph glands.

II. Oculo-glandular, in which the primary lesion is a conjunctivitis; with enlargement of the lymph glands.

III. Glandular, in which there is no primary lesion at the site of infection, but enlargement of regional lymph-glands.

IV. Typhoid Type, in which there is no primary lesion and no glandular enlargement.

Tularemia is not spread from animal to animal, nor from man to man, directly. It is carried from animal to animal by insects, and man may be infected by the bites of insects, which have bitten infected animals, or by handling infected animals or carcasses. McCoy and Chapin's researches appeared to show tularemia to be primarily a disease of rodents. In point of fact it is most prevalent among rodents, and as Nikanoroff suggests, "these animals may be nature's reservoir for the virus."

The animals which have been proven beyond doubt to propagate the disease are the jack-rabbit, the wild hare, and the ground squirrel, though the disease was also found to be transmitted by the wolf and by tick-infected sheep. Green, Wade, and Dewey proved that muskrats were very susceptible to experimental infection with bacterium tularensis, so the possibility of the disease occurring in these rodents appears to be established.

Schwartz, in 1919, described two cases of ulcero-glandular tularemia observed in Montana in two Japanese, both of whom contracted tularemia when handling muskrats. In Soviet Russia four epidemics have occurred in which all the sufferers were engaged in catching or handling water rats, so we will have to include them in the list of rodents capable of spreading the disease.

Mease observed one case of ulcero-glandular tularemia, in a man of 53 after skinning diseased opossums. In this case the disease manifested itself after an incubation period of fourteen hours. In Russia the hamster has been found to be infected with the disease. This is of importance, because of the demand for the fur of these animals, and the serious damage to crops by these animals, especially in the Ural regions, which cause them to be actively hunted.

\*Director, Sussex County Health Unit, State Board of Health.

Tularemia was observed in cattle and sheep by Parker, Bruce and Marsh in California. Certain birds also appear to be receptive to tularemia infection. Parker studied the disease in quails. He investigated the history of two persons said to have contracted tularemia after having prepared quails, and he also knew that these birds were infected with the same ticks as rabbits.

The number of animals capable of contracting and transmitting tularemia will thus be seen to have increased considerably since McCoy and Chapin discovered the disease in ground-squirrels, and it is quite possible that subsequent studies may reveal the existence of the infection in other animals, as yet unsuspected.

Transmission from animal to animal or from animal to man is through the bite of a fly or tick, or through the contamination of broken skin or of the conjunctivae by infected humors of the animal.

Infection by insects in man usually takes place through the bite of a horse-fly (*chrysops discalis*) or a tick (*dermacentor andersoni*). Flies can also transmit the disease, which is described in Utah as cattle-fly fever. Not only the insects themselves but also their excrement may be a medium of transmission. The disease is transmitted from animal to animal by fleas, lice, bugs, flies, and other blood-sucking insects, especially ticks.

Tularemia may also be contracted by man when skinning or dressing infected animals, this being practically the only means of transmission established in the epidemics in the U. S. S. R. and it is probably also the means whereby laboratory workers have contracted the disease. Tularemia exhibits seasonal variations, depending upon the peculiar transmitting agent. Where ticks are the chief agents, March to June is the worst time; where flies are the agent, June to September. In the case of wild rabbits, which are the chief source of infection of man in this country, most cases occur from November to January.

Tularemia in humans is an occupational disease, nearly all reported cases having occurred in hunters, cooks, and laboratory workers. Malcolm Pfunder described the case of a farmer who contracted tularemia after removing ticks from his horse: he had rubbed his eyes before washing his hands, severe tularemic conjunctivitis resulting.

In America the majority of patients contracted the disease when dressing rabbits. Next to

hunters, laboratory workers are most often infected. Simpson pointed out the comparatively high death rate among laboratory workers. The typhoid form seems to occur much more frequently in laboratory workers than others. The ulcero-glandular form seems to occur much more frequently than other types. In 225 cases examined by Francis, 150 were of this type, 22 oculo-glandular, 11 glandular, and 20 of the typhoid type.

Tularemia apparently confers permanent immunity after the first attack. Francis has not observed any case of relapse, though Simpson observed one such case in a man two and a half years after the first attack. Animals do not appear to possess the same degree of immunity, and the first attack offers no guarantee of immunity.

A case reported by Dr. Johnson, health officer of National City, proves the existence of the disease back to 1904, and also is proof of the preservation of agglutinins after an attack of tularemia. On May 30, 1904, Dr. Johnson's son, then fifteen years of age, killed and dressed 12 hares, but in so doing pricked himself with what appeared to be a "sliver." Four days later he became ill. His hand was swollen and there was swelling of the epitrochlear and axillary glands. His temperature reached 104° F. His father took a specimen of his blood, which he preserved, and twenty-four years later, June 6, 1928, the patient's serum agglutinated "bacterium tularensis" in dilutions from 1/10 to 1/160. There was no doubt as to the diagnosis of the disease.

Tularemia in the United States appears to have spread from west to east. Although in many of the states it is not a reportable disease, cases have been reported in practically all the states except New England. Not until the autumn of 1930 was the first case reported in Delaware. This was in a man who had dressed rabbits three days previously, and had a typical attack of the ulcero-glandular type. It may be possible that other cases have not been diagnosed, or have not applied for treatment, but the fact that we have had at least one case in the state, should put all physicians on their guard, especially in the gunning season.

Four extensive outbreaks have occurred in Russia since 1926, the first in May, 1926, in a region southwest of Astrakhan, in which 200 cases were recorded, none of which proved fatal. Two years later (1928) in the province of Riazan, on

the left bank of the Oka, a tributary of the Volga, a second outbreak occurred. In this epidemic 800 cases are recorded. The third occurred in August, 1928, in the Orenburg section, and broke out simultaneously in several villages on both banks of the Ural. 105 cases were recorded in the region, though actually there must have been more, as many people hid themselves, someone having spread the report that the sick would be shot. The fourth occurred in 1928 in the region of Tobolsk. In all of these epidemics the disease was contracted by water-rat catchers, the rats being caught for their skins, which had become valuable. Practically every one who acquired the disease had come in actual contact with the rats, but a few had not.

#### PREVENTION

No curative serum or preventive vaccine has been discovered. Care should be taken in the handling of rabbits. This has been summed up by the U. S. Public Health Service as follows: "Beware of wild rabbits, one per cent of them are infected with tularemia. Rabbit meat thoroughly cooked is harmless as food, because a temperature of 133° F. (55° C.) kills the infecting organism. Rubber gloves should be worn by those who have to dress wild rabbits. Beware of the wild rabbit, which a dog or cat has caught, or which a boy has killed—it is probably a sick rabbit. The hunter should not shoot his rabbits at the point of a gun; let him shoot them on the run at 75 yards, say."

### THE WASSERMANN AND KAHN TESTS

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Each specimen of blood and spinal fluid submitted to the Delaware State Board of Health Laboratory to be tested for evidence of syphilis is examined by two distinct methods, the Kahn precipitation test and the Kolmer quantitative complement fixation reaction.

The Kahn precipitation test, as done routinely in this laboratory, is identically the same as that performed in laboratories of the Michigan Department of Health. The technic is much simpler than the Wassermann. The patient's blood serum, antigen and physiological saline are the only reagents used in this test. The Wassermann reaction requires the use of six

reagents. The Kahn test, though simpler in technic, requires about twice as much serum as the Kolmer Wassermann. The consensus of opinion among leading serologists and immunologists is that two or more types of tests are necessary for a correct laboratory diagnosis of syphilis. Careful research and checking of laboratory results with clinical symptoms have revealed the fact that while in the majority of cases the two tests check remarkably well, a few positives are picked up by each test alone that would have been missed by the use of only one test.

#### The Kahn Test

Although only three reagents are used in the Kahn test, these must be prepared and used with the same accuracy and precision that are so essential in the Wassermann reaction. The preparation of antigen embraces a series of four ten-minute ether extractions (anaesthesia) of powdered beef heart, after which the powder is dried, weighed and extracted with 95% alcohol for three days at room temperature. It is then filtered. To each c. c. of the alcoholic filtrate, six milligrams of cholesterol are added. The antigen is then titrated and standardized.

#### PREPARATION OF SERA

Specimens of patient's blood are received from physicians in a Keidel tube. On its arrival at the laboratory the specimen is given a number, and the same number is placed on the accompanying slip bearing patient's and physician's name. On the day when the tests are run, the sera are separated from the clot and centrifuged to remove red blood cells. The sera are then placed in a water bath at 56° C. for thirty minutes, after which they are ready for the test.

#### THE TEST

An antigen suspension is first prepared by mixing designated amount of antigen with physiological salt solution (according to Titri). It is then allowed to stand at room temperature for ten minutes. At the end of this period, the antigen is pipetted into the bottom of test tubes —.05 in first tube, .025 in second tube and .0125 in the third tube. 0.15 c. c. of serum is then pipetted into each tube. The tests are placed in Kahn shaking machine and shaken for three minutes at the rate of from 275 to 285 oscillations per minute. After shaking, the tests are removed from the shaking machine and 1 c. c. salt solution is added to first tube, 0.5 c. c. to each of the other tubes.

\*Director of Laboratory, State Board of Health.

### READING THE TESTS

The reading of the Kahn test is based on the amount of precipitate present in each tube. Each tube is read separately, and the average of the three tubes is taken for the final result. For instance, if each of the three tubes is filled with a heavy precipitate, the final result is four plus. If the first has but a small amount of precipitate, and is read as one plus, and each of the other tubes is filled with precipitate and read as four plus, an average of the three tubes, or three plus, is taken as the final result. Entire absence of precipitate is interpreted as negative. A control consisting of patient's serum and saline without antigen is made on each positive serum, as a serum is occasionally encountered which contains a natural precipitate of its own, which is easily confused with that of the test.

### Kolmer Wassermann Test

The Wassermann reaction requires the use of patient's blood serum, hemolytic amboceptor, sheep blood corpuscles, complement, antigen, and physiological saline.

The preparation of blood sera is the same as for the Kahn test except it is heated in water bath for 15 minutes at 55° C. instead of thirty minutes at 56° C. The heating or inactivation of the sera at this temperature removes anti-complementary substances, complement and the possibility of non-specific proteotropic reactions.

#### AMBOCEPTOR

Hemolytic amboceptor or hemolysin is furnished by the serum of a rabbit which has had sheep blood corpuscles injected into its blood. The sheep cells are an antigen which stimulates the body cells of the rabbit to produce an antibody in the nature of a hemolysin. The amboceptor will hemolyze or dissolve sheep cells, but not the corpuscles of any other animal. It is called anti-sheep hemolysin. It is heated before being used to destroy any native complement. The hemolysin is titrated each day the Wassermann tests are made to determine the unit to use in tests.

#### SHEEP BLOOD CORPUSCLES

The sheep blood is filtered to remove fibrin and then washed with physiological saline about six times to remove all of the serum. A 2% corpuscle suspension is used in tests.

#### COMPLEMENT

The fresh pooled blood sera of two or more guinea pigs is employed as complement. The

complement is titrated each day tests are made to determine the unit to be used.

#### ANTIGEN

The antigen for this test is prepared as follows:

1. Place 25 gm. of the powdered beef heart (Bifco) in a bottle with 200 c. c. of ether for five days, shaking several times each day. Remove the ether and preserve it.

2. Dry the extracted powder by spreading on a glass plate for several hours. Transfer to a bottle, and cover with 200 c. c. of 95 per cent. alcohol. Place in an incubator for four days, shaking occasionally.

3. Carefully pour off the alcohol into a flat dish, retaining the powdered muscle in the bottle for use in Step 5. Evaporate the alcohol under an electric fan and to the residue in the dish add 30 to 50 c. c. of ether. Stir well, cover, and let stand an hour or two for the insoluble particles to settle out. Pipet off the ether and add it to the ether used for the first extraction in Step 1 above.

4. Place the whole quantity of ether in a dish and evaporate to about one-fourth its volume, or 25 to 30 c. c. Now add six volumes (or about 150 c. c.) of pure acetone, stir well, and set aside, covered, overnight. A precipitate will form. Next day decant the acetone, transfer the sticky sediment to a bottle, cover with acetone, and preserve for use in Step 6.

5. To the muscle powder left after decanting the alcohol in Step 3 add 100 c. c. absolute, acetone-free ethyl alcohol. Cork tightly and place in an incubator for six days, shaking several times each day. If possible it should also be shaken for a day in a mechanical shaker. Filter this alcoholic extract through fat-free filter-paper and preserve for use in Step 6.

6. Dissolve 0.2 gm. pure cholesterol and all of the acetone-insoluble residue of Step 4 in 10 c. c. pure ether. Add this cloudy mixture to the filtered alcoholic extract of Step 6, and shake well.

7. Place the solution in the incubator overnight, and then keep at room temperature for a day or two, shaking occasionally, and finally filter through fat-free paper. This filtrate is the finished antigen and should be preserved in tightly stoppered brown glass bottles. Any precipitate which forms should be disregarded. Antigen is then titrated to determine dose to use in tests.

### PHYSIOLOGICAL SALINE

The saline solution is prepared by adding 8.5 grams C. P. sodium chloride to litre of water.

### THE TEST

1. In an appropriate rack, arrange 6 tubes for each serum to be tested, including a known positive and a known negative serum; also 3 additional tubes for controls of antigen, hemolytic system, and corpuscles.

(a) The required dilutions of serum are obtained as follows: Place 1.2 c. c. of physiologic salt solution in Tube No. 1 to each set; 0.5 c. c. in Tubes Nos. 2, 3, and 5, and 2 c. c. in Tube No. 4. To Tube 1 add 0.3 c. c. of the inactivated serum to be tested, and mix well. From Tube 1 transfer 0.5 c. c. to Tube No. 2, and 0.5 c. c. to Tube 6. Mix; transfer 0.5 c. c. from Tube No. 2 to Tube No. 3. Mix Tube No. 3 and transfer 0.5 c. c. to Tube No. 4. Mix Tube No. 4, transfer 0.5 c. c. to No. 5, and discard 1.5 c. c. Mix Tube No. 5, and discard 1.5 c. c. Mix Tube No. 5 and discard 0.5 c. c. Tubes Nos. 1 and 6 contain .1 c. c. patient's serum. Tube No. 2 contains .05 c. c. patient's serum, No. 3 contains .025 c. c. patient's serum, Tube No. 4 contains .005 c. c. patient's serum. Tube No. 5 contains .0025 c. c. patient's serum.

(b) 0.5 c. c. of antigen carrying 10 antigenic units, as determined by titration, is added to first 5 tubes of each specimen, but not the sixth tube. The sixth tube is serum control tube.

(c) The tubes are allowed to stand for five to thirty minutes before adding complement.

(d) 1 c. c. carrying two full units of complement, as determined by titration, is added to each of the six tubes for the test.

2. The racks containing the tests are then placed in a refrigerator at 6° to 8° C: for from 15 to 18 hours.

3. At the end of ice-box incubation the tubes are warmed in a water-bath 38° C. for from 5 to 15 minutes. Then .5 c. c. of antisheep hemolysin containing 1 unit is added to each tube, and .5 c. c. of 2% sheep corpuscles suspension is added.

4. The racks are then placed in a water-bath for an hour. After this they are permitted to stand a short time to allow the corpuscles to settle. The readings are then made.

### INTERPRETATION OF RESULTS

If there is a partial or complete fixation of

complement in the first four, or all five of the tubes, a very strongly positive result is given. If there is partial or complete fixation of complement in the first three tubes, a strongly positive result is given. If there is a partial or complete fixation of complement in the first two tubes, a moderately positive result is given. If there is partial or complete fixation of complement only in the first tube, a weakly positive result is given. Negative when all tubes show complete hemolysis.

### Comparison of Results of Kahn and Wassermann

Since April, 1927, this laboratory has examined 11,142 samples of blood and spinal fluid for syphilis by the Kahn precipitation test and Kolmer quantitative Wassermann. The results of these two tests agreed approximately in 10,497 instances. Of the specimens which did not agree, 324 reacted with the Kahn test and were negative with Wassermann, 189 reacted with Wassermann and were negative with Kahn, 132 specimens were hemolyzed when received and gave indefinite reaction with Kahn and were anti-complementary with Wassermann.

From the incomplete information received with the specimens, it would appear that the Kolmer is slightly more sensitive in picking up cases of primary syphilis. In a few cases where the patient has been receiving treatment for several months, and the Kolmer Wassermann is negative, the Kahn still remains positive, indicating, so far as we can judge from the laboratory findings, the need of further treatment, after which the Kahn will usually become negative.

### PROGRESS IN THE HEALTH DEPARTMENT

A. C. Jost, M. D.\*

Dover, Del.

It has been the recent unfortunate experience of several state health departments to have to narrow their fields of effort as a result of the curtailment of their budgets, thought necessary because of the widespread economic depression. Delaware is one of the relatively few states in which expansion, not contraction, has been possible.

It is quite in keeping with the trend of recent events to give increasing attention to the neces-

\*Executive Secretary, State Board of Health.

sity of reducing maternal and infant mortality. Heretofore this subdivision of the health department's work has been combined with the task of supervision of one of the county health units. Hereafter, however, it will be possible to separate these duties. The addition of another county unit officer to the staff of the department having been provided for, Dr. C. A. Sargent will be able to pay more attention to maternal and infancy welfare, his place as county unit officer for Kent County being taken by Dr. E. F. Smith, transferred from Sussex County for this purpose.

The board considers itself very fortunate in having procured the services of two Delaware physicians to fill the two vacancies in the county units. Dr. J. R. Downes, formerly engaged in private practice at Newark, and Dr. E. Reynolds, formerly in New Castle, will be placed in charge of the county units in New Castle and Sussex Counties, respectively. Both of these have established for themselves very satisfactory records as practitioners, and enjoy to a marked degree the confidence of the profession of the state. Success in their respective fields during their tenures of office can confidently be expected.

In addition to these, still another has been placed on duty, in the person of Dr. Beatty, formerly on the staff of the Homeopathic Hospital in Wilmington, but now assistant to Dr. Phillips at Brandywine Sanatorium. This addition to the Brandywine staff was made necessary to meet the demands on Dr. Phillips' time occasioned by the increased number of patients in the sanatorium and attending the clinics throughout the state, and in preparation for still larger numbers of patients, when the building program now being carried out has been concluded. It is thought that the additional construction will add about sixty beds to the seventy-five or more now provided in that institution.

The pressure of work in the laboratory has latterly been such that in that division also an increase of staff had to be provided for. The technician recently appointed has had special training in chemistry, and will assist in the chemical analyses which come within the province of the laboratory. If in addition it will be possible to arrange for the analysis of food specimens brought in by the inspectors, this will be undertaken. This is the more important, since

it is desired that more attention will be paid to the inspection branch of the sanitary engineering division. Two additional sanitary inspectors have already been appointed, and the teaching function of these inspectors, their most valuable function, will be made use of in order to bring about more sanitary conditions in the dairies, canneries, shucking houses, eating houses, or other places where their inspection duties call them. The nursing personnel will also be increased, though it may not be possible to do this by other than nurses employed jointly by the State Board of Health and certain school districts, which desire for their pupils a more careful and continuous inspection, with a closer follow-up than it has been hitherto possible to procure.

Among the school children the newly created corps of dental hygienists will for the present at least find an ample field for their labors. The amount of money voted by the legislature will provide for the appointment of seven, including Miss Gladys Shaffer, who has been selected to head the division. All the appointments have at the present time been made, and the arrangements are being carried out which will permit this greatly needed reparative and preventive work being entered upon, immediately upon the reopening of the state schools at the close of the summer vacation.

In addition to completing the arrangements for these additions to the staff, considerable progress has been made in the preparation of the regulations for the notification and the control of communicable diseases under the authority of the legislation granted during the session. These will involve little or no change from the procedure at present being followed, being drafted, in fact, from the same committee report which forms the basis of the routine now followed. The passage of the legislation, however, establishes a more ample legislative authority for the regulations, and removes from the statute books some obsolete provisions very out of line with modern practice. When the regulations shall have been completely drafted, it is the intention to place them before the profession of the state for an expression of their opinion, and to provide those who must hereafter work under their provisions the opportunity of acquainting themselves thoroughly with the procedure they outline.

# EDITORIAL

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### HEALTH STATISTICS

The feeling aroused in many persons when figures are mentioned, or proof of any assertion based on statistics is presented, is one of distrust, if indeed it is not one of actual repugnance. These are at once connected with the memory of their salaries (always smaller than they think merited), their taxes (always higher than they think necessary) or their bank balances (which seem to disappear most inopportune and inexplicably). The very sight of a column of figures is annoying. The very mention of anything so prosaic, so hard, so unyielding causes them impatience. Nor is the impatience wholly unjustified, when one realizes how often attempts are made to adduce from certain figures conclusions which they do not contain and which in no possible way can be deduced from them. If figures were articulate, the whole world would

resound with the wails of their protests at the way in which they have been maltreated.

But they are essential to the health worker, and their intelligent use is always and amply justifiable. This fact is often not wholly perceived by the practitioner whose interest in his patient is wholly personal and individual. He is engaged entirely in the tactical question of how best to meet the single emergency which confronts him, how best to protect the patients who singly place themselves under his care or seek his guidance. The strategical question of disease attack is usually not his to worry over, and he very often has not the patience to loan his time and his thought to a consideration of any subject bristling with those symbols which he despises, symbols which have forced themselves on his notice in so many unpleasant ways.

Those whose approach to disease attack must be made in a wholly different way, must, however, view the symbols in a wholly different light, must rely upon them to indicate where his attack must be undertaken, must judge by them the extent to which his efforts are succeeding or unhappily are failing. In the strategy of disease attack their use is essential. Happy is he who knows how to treat so valuable allies with the consideration they merit.

### COST OF MEDICAL CARE

With but short intervals of time between them, the publications of the Committee of the Cost of Medical Care have been appearing on our desks, as the committee considers that its investigations along certain lines have been completed and the results of the investigations are ready for publication. The lay press as well have been made aware of the progress of the study, as their rather frequent editorials bear witness.

It is a stupendous task which has been set before the committee. The reason for its formation was presumably the appreciation of the rapidly growing extension of the cost to the individual, if he wishes to secure for himself and his family adequate medical attention, and the desire, either to lessen the cost or to make more effective use of the money being expended. Unless some provisions can be made along one or the other of these lines, it seems rather difficult

to justify the existence of the committee, and possibly more harm than good can come from there having been collected a mass of material, capable of being used for the prejudice of the legitimate profession. It will be of no especial value to know the tremendous totals of the moneys expended, if the committee cannot indicate wherein economy can be effected or more treatment secured for the same outlay by a more judicious expenditure. Fact-finding, with no provision for the implementing of the facts to the benefit of the public would seem to be a futile waste of time, if indeed it may not be a detriment.

If the committee cannot indicate where improvements can be effected, if it is not given the authority to enforce action (if any action on the part of the profession can bring about amelioration) one is quite prepared to expect that interests hostile to organized medicine might be provided with material which might be used for purposes far different from those which were the intention when the committee was called into being.

#### EDITORIAL NOTES

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We present again for your delectation and approval our annual State Board of Health Number. You who have read this issue from the first page to this one know by now what splendid material the department has provided. The literary efforts of our Dover confreres equal their clinical ones, which is saying a lot. We notice that many of the state journals are now devoting a special issue to their department of health, and we congratulate ourselves that we were able to jump on the band-wagon relatively early in the game. Our thanks to Dr. Jost, et al.

Vacation time is here. Many of us have the time or have the inclination, but do not have the price. Those of us who have the price may

well save part of it, for the general public seems to have declared a moratorium long before Hoover or any other politician thought of a moratorium. Bearing in mind that the word means, in effect, "the accounts are dead," we expect to see a new crop of pathologists, since this is the only species of homo medicus that gets paid for handling "dead" accounts.

Plans are being made for the next annual session of the Medical Society of Delaware, which will be held in Wilmington on October 13, 14 and 15. The tentative program fully upholds the scientific standards of a society that has held previously 141 annual sessions. Every Delaware physician should plan to attend.

#### DELAWARE PHARMACEUTICAL SOCIETY

##### LEGAL SERVICE RENDERED BY CORPORATIONS

From time to time we have taken occasion to direct the attention of JOURNAL readers to various judicial decisions wherein the courts have held quite uniformly that it is unlawful for a corporation or unlicensed individual, either singly or in groups, to engage in the practice of medicine, dentistry, or law, even though licensed practitioners be employed to render such professional service. In this connection it should be borne in mind that in every case of this kind heretofore tried out in the courts all manner of evidence has been submitted by the defense to uphold the claim that the professional advice and service made available to the public by the accused corporation or unlicensed individual are invariably furnished by duly licensed physicians, dentists, or lawyers, as the case may be.

Now, of course, we have no fault whatever to find with court decisions of this nature, but, quite to the contrary, we readily agree with the conclusions reached by the courts in all such cases. Furthermore, we heartily indorse the position taken by the courts holding, in effect, that it is not only against public interest, but distinctly prejudicial to the welfare of the people as a whole to permit corporations or individuals lacking proper professional qualifications to engage in such practice. This rule holds good, whether or not the actual service of a professional nature is rendered exclusively by competent assistants or employees duly registered and legally qualified under the law to render such service.

As we view the vital question involved in cases of this kind, such as have been tried out in the courts, it seems altogether clear that the law is correctly interpreted and the findings of the court wholly in the public interest. However, with each recurring decision we find ourselves more and more perplexed over the apparent inability of the judiciary to apply the same test and follow the same process of reasoning with respect to questions involving the right to practice pharmacy, which, of course, includes the right to open and operate retail drug stores.

Take for instance the decision of the Supreme Court of the United States in the celebrated Pennsylvania Ownership law case, involving the right of a corporation to practice pharmacy within the bounds of the state. Here we find great stress laid upon the requirements of the pharmacy law of the state, restricting and limiting to duly qualified pharmacists all acts of a pharmaceutical nature, such as the handling of drugs, chemicals, and poisons, and the compounding of physicians' prescriptions. Strange to relate, the high court in reviewing this case could see no necessity whatever for any further safeguard being thrown about the practice of pharmacy, and accordingly held the ownership law unconstitutional. As a result of this an unlicensed person, group of individuals, or a corporation may open and operate retail drug stores in Pennsylvania, provided registered pharmacists are employed in such establishments to handle drugs, chemicals, and poisons, and to compound physicians' prescriptions.

In striking contrast with the findings of the Supreme Court of the United States in the Pennsylvania Ownership law case, the Supreme Court of the State of Illinois handed down a decision only a week or so ago, in which it was held that banks and trust companies have no right to engage in the practice of law. In this case the court even went so far as to impose a fine of \$1,000 against a local bank for employing attorneys who furnished legal service to the patrons of the bank. It will be of further interest to know that the Chicago Bar Association was joined by the Illinois State Bar Association in the proceedings leading up to the decision of the court, prohibiting all banks and trust companies from employing attorneys to furnish legal aid to the customers of such institutions and imposing a fine upon the bank cited in this case. This ruling not only bars banks and trust companies from giving legal service and acting as attorneys for

executors and administrators, handling real estate transactions, examining abstracts of real estate titles, and drawing wills, but applies with equal force to all corporations. Here then is a clear case in which the high court of the state of Illinois holds that a corporation may not furnish any kind of legal service to its patrons, even though duly qualified practitioners of law be employed to render such service.

Frankly admitting our inability to harmonize these very conflicting decisions rendered by the high court of a state and the highest court in the United States, it does seem to the lay mind that our friends in the legal fraternity are ever alert in guarding their own interest, but somewhat indifferent concerning the rights of others similarly situated.

Still holding to the old-fashioned belief that what is sauce for the goose should likewise be sauce for the gander, we would suggest to all parties interested in pharmacist ownership legislation and the enforcement of such laws that the very next time a measure of this kind is up for judicial interpretation, particular emphasis be laid upon the decision of the Supreme Court of the State of Illinois, prohibiting trust companies and other corporations from furnishing legal advice to their patrons through the medium of employees registered as legal practitioners.—*N. A. R. D. Journal*, July 2, 1931.

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## MISCELLANEOUS

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### Correspondence

Dear Dr. LaMotte:

I am informed that the courts of the State of Michigan have held in almost every instance that a Doctor is guilty of malpractice if he undertakes to treat a case, especially in fracture work, and, of course, where a bad result is obtained, without first obtaining x-rays to guide the treatment through to the end of the case.

The following letter, with reference to this matter, was sent out to the members of the Michigan Medical Society by Dr. F. B. Tibbals, Chairman of the Medico-Legal Committee:

"By direction of the Council this letter is being sent to you over the signature of the Chairman of the Medico-Legal Committee. You are urged to give it very careful attention and be guided by the recommendations herein contained. Your Medico-Legal Committee takes this opportunity of calling members' attention to the importance

of xray and the necessity of procuring xray records in your practice. This is essential for your personal protection.

"Unquestionably, the xray is one of the most important advances in medical and surgical diagnosis. Clinical experience or ability cannot substitute for the xray in your fracture practice. We wish, therefore, to impress upon every member for his own protection that whenever you are asked to treat any accident cases where there is any possibility that a fracture or a dislocation may be present, *you should insist upon an xray picture and record before you proceed with the care of the case.* This is extremely important, due to the fact that you must be able to prove, in court if necessary, that you at least asked for a radiograph but were refused. Where you are refused an xray you should obtain and preserve a written statement to that effect. This statement should be dated, signed by the patient, signed by yourself, and in the presence of one or two witnesses who also attach their signatures to the statement. This statement should then be carefully preserved for future reference. In fact, it is recommended that you should decline to diagnose or treat any case where you deem xray pictures necessary for the proper care and treatment and in which your patient refuses to have an xray taken.

"This xray should be used not only in the diagnosis of fractures but at least once after reduction to prove proper reduction, and then again when the case is discharged to prove the final result. It is also advised that several xray records be made during the course of treatment in order that you may show and be informed that position and anatomical reduction is being maintained.

"The Courts of the State of Michigan in almost every instance hold that a *doctor is guilty of malpractice* if he undertakes to treat a case, especially in fracture work and, of course, where a bad result is obtained without first obtaining xrays to guide the treatment through to the end of the case. The xray should be used not only in the diagnosis of fractures but once at least soon after the reduction, to prove proper reduction, and preferably several times afterwards, to prove maintenance of reduction, and finally at close of treatment, to prove firm union. The professional man who has thus safeguarded himself need have no fear of suit. If the xray check shows a fracture which cannot be retained in good anatomical position, knowledge of this fact should

enable the doctor to place upon the patient a responsibility for choice between the hoped for but uncertain result of useful function, and operative treatment, with its occasional hazards.

"We have to defend every year one or more cases of unsuspected fractures where no xray has even been suggested. In several such cases it was a cultist, who months later ordered a diagnostic xray. We have been able to successfully defend but one of these cases upon the theory that no better results could have been obtained even with proper diagnosis. Such a theory, however, would not hold true in most cases and is a poor substitute for treatment based on accurate diagnosis.

"We have many suits brought as an offset to the doctor's suit for fees. Every doctor should know that the statute of limitations for adults is two years and should wait over two years before attempting to enforce collection."

Can you tell me whether this view is held by the courts of the state of Delaware and whether legislation has been enacted requiring that physicians employ xrays in the diagnosis and during the course of treatment whenever the diagnosis of a condition might be more accurate and the treatment guided more correctly by the use of xrays. Any information you can give me on this subject will be, indeed, appreciated.

Yours very truly,  
H. J. HOLMQUEST,  
Consultant Engineer,  
Gen. Elec. Xray Corp.

#### Propaganda for Reform

Norman Baker's Radio Station KTNT.—Norman Baker, of Muscatine, Iowa, is known to the medical profession chiefly because he blackguards the profession and because he exploits alleged cancer cures as part of his many commercial activities. He is suing the American Medical Association for half a million dollars for alleged libel. Not long ago, Norman Baker applied for a renewal of his broadcasting license for his station, KTNT. The chief examiner for the Federal Radio Commission recently filed with the commission his report recommending that the license be not renewed. It is reported that the commission extended the license until April 30, 1931, pending final decision. (*Jour. A. M. A.*, April 4, 1931, p. 1167).

## BOOK REVIEWS

Collected Papers of the Mayo Clinic and of the Mayo Foundation. Vol. XXII, 1930. Edited by Mrs. Maud H. Mellish-Wilson, Richard M. Hewitt, M. D., and Mildred A. Felker, B. S. Pp. 1125, with 234 illustrations. Cloth. Price, \$13.00. Philadelphia: W. B. Saunders Company, 1931.

The present Mayo volume follows its predecessors in general characteristics and quality. There are 170 titles, by approximately 250 authors, divided into sections devoted to special regions. The alimentary canal leads, with 48 papers; the ductless glands, 5. A review is obviously impossible; however, the volume represents a survey of the latest developments in all branches of medicine and surgery, made readily accessible by an excellent index, and as such will be appreciated by that portion of the profession that wishes to keep abreast of the times.

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New and Nonofficial Remedies, 1931, containing descriptions of the articles standing accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1931. Cloth. Price, postpaid, \$1.50. Pp. 481 + LVI. Chicago: American Medical Association, 1931.

This volume is the annual publication of the Council on Pharmacy and Chemistry of the American Medical Association, giving the latest authentic information concerning those of the newer medicinal preparations found worthy of the consideration and use of the medical profession. Each year the council scans the general articles under which the various preparations are classified and revises these to conform to the latest and best medical thought.

A glance at the preface shows that a number of preparations have been omitted because they conflict with the rules that govern acceptance, because their distributors did not present evidence to demonstrate their continued acceptability, or simply because the manufacturers have taken them off the market. Important revisions have been made in a number of the general articles and in the descriptions of various preparations. Among the new preparations that have been found by the council during the past year to be eligible for admission to the book are: amyta and pulvules sodium amyta, 3 grains, barbituric acid derivatives for use preliminary to surgical anesthesia; thio-bismol, quinine bismuth iodide, sodium potassium bismuthyl tartrate, and tarto-quinibone, bismuth compounds for use in the treatment of syphilis; scillaren and scillaren-B, preparations containing the squill glucosides; two new cod liver oil concentrates;

synephrine, a new vasoconstrictor, and synthetic thyroxine.

*New and Non-official Remedies* should be in the hands of all who prescribe drugs. The book contains information about the newer *materia medica* which cannot be found in any other publication.

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Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1930. Cloth. Price, \$1.00. Pp. 91. Chicago: American Medical Association, 1931.

This book is essentially a record of the negative actions of that distinguished body, the Council on Pharmacy and Chemistry of the American Medical Association; that is, it sets forth the findings concerning medicinal preparations which the council has voted to be unacceptable for recognition and use by the medical profession. Many of the reports record outright rejection or the rescinding of previous acceptances; others report in a preliminary way on products which appear to have promise but are not yet sufficiently tested or controlled to be ready for general use by the profession.

Among the reports recording outright rejection are those on: avesan (H), formerly nuforal, a mixture marketed with unwarranted claims of usefulness in the treatment of tuberculosis, asthma, and other respiratory diseases; ceano-thyn, once before rejected and still found to be marketed with unsupported therapeutic claims; collosol calcium and collosol kaolin, so-called colloidal preparations, the former an unscientific mixture of unproved value, the latter a possibly dangerous preparation, and both marketed with unwarranted claims; ephedrol with ethylmorphine hydrochloride, an unscientific ephedrine preparation marketed under an unacceptable proprietary name with unwarranted therapeutic claims; farastan, an unscientific iodine-cinchophen preparation proposed for routine use in "arthritis . . . and rheumatoid conditions"; Haley's M-O magnesia-oil, a magnesia magma and liquid petrolatum mixture in fixed proportions marketed with emphasis on the "M-O"; lydin, a testicular extract, marketed with claims of value in the treatment of impotence; and metatone, a shot-gun "tonic" mixture marketed under a proprietary name with unwarranted therapeutic claims.

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